

# CRS Report for Congress

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## Oil and Gas: Supply Issues After Katrina

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### Summary

Hurricane Katrina made landfall on August 29, 2005, leaving behind considerable devastation. Some onshore refineries were shut down in advance of the storm; others remain down now because of the widespread interruption of electric power and flooding. Assessment of damage to oil and gas production rigs, as well as refineries, continues. Some operating refineries whose crude supply has been interrupted are borrowing crude from the Strategic Petroleum Reserve (SPR). On September 2, the International Energy Agency (IEA) announced a coordinated drawdown of European and Asian stocks totaling 60 million barrels to be released at the rate of 2 million barrels daily. Some refineries have resumed operation, but at reduced runs. A number of major refineries remain shut. The Louisiana Offshore Oil Port (LOOP) resumed operation late September 1, and is accepting crude oil imports. The Colonial pipeline, which supplies refined products to regions of the South and Northeast, has resumed operation and is at 100% of pumping capacity. The industry advises that it may be months before the area's oil and gas production and refining are fully restored. Spot and futures prices for gasoline and middle distillates rose sharply in the days following the storm, but prices began to fall early the week of September 5. This report will be updated.

Hurricane Katrina shut down oil and gas production from the Outer Continental Shelf in the Gulf of Mexico, the source for 25% of U.S. crude oil production. Several oil refineries that provide a significant share of the nation's refined petroleum products remain shut down along the Gulf Coast in Louisiana and Mississippi. Much of the product from Gulf refineries is transported by pipeline for the East Coast and upper Midwest. Important to policymakers will be continuing information on the damage to production facilities, refineries, and transport facilities and how soon they can be restored to operation. Most of the information cited in this report is from the trade press and the Energy Information Administration.

On August 31, Secretary of Energy Bodman announced that the Bush Administration was authorizing releases of Strategic Petroleum Reserve (SPR) crude oil. Operating refineries whose crude supply has been interrupted have requested to borrow roughly 9 million barrels. The release of SPR oil and the announcement on September 2 from the International Energy Agency (IEA) of a coordinated drawdown of 60 million barrels of

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crude and refined products calmed markets by early in the week of September 5. The first of this supply should reach the United States by mid-September. However, recovery from the hurricane's effects will depend upon resumption of production and refining operations in the Gulf, and the ability to transport petroleum products.<sup>1</sup> Roughly 1.3 million barrels of refining capacity in the Gulf remains completely shut down, but total capacity lost may approach 2.0 million barrels. When refineries resume operation, runs are sharply reduced and then increase over a number of days.

## Factors Affecting Oil and Natural Gas Supply

- *Outer Continental Shelf (OCS) Production.* Natural gas and petroleum production in the Western Gulf of Mexico is virtually halted. Eastern Gulf output is seriously curtailed. About 1.0 million barrels per day (mbd) of crude and 5.2 billion cubic feet per day (bcf/d) of gas output are currently offline.<sup>2</sup>
- *Postponement of Natural Gas Deliveries at Henry Hub.* This is the delivery point, located in Louisiana, for purchasers taking physical delivery of gas traded on the New York Mercantile Exchange (NYMEX). Trading was briefly interrupted following the hurricane, but the timing of physical delivery of natural gas contracts is unclear. The Henry Hub gas contract is an important pricing benchmark widely used in setting prices nationwide.
- *Lack of Alternative Gas Supplies.* OCS natural gas supply losses are not easily made up by imports because additional supply possibilities from Canada and from liquefied natural gas (LNG) are limited. There is no Strategic Petroleum Reserve (SPR) for gas. A short-term problem could worsen if the shortage continues into the heating season.
- *Crude Oil Imports via Louisiana Offshore Oil Port (LOOP).* About 1 mbd of crude oil imports flow through this tanker offloading facility. This constitutes roughly 5% of petroleum consumption.<sup>3</sup> LOOP resumed operation late September 2, delivering crude to an operating Exxon refinery in Baton Rouge, Louisiana. On September 5, LOOP reported that it was operating at full capacity. Other Gulf Coast ports through which oil imports flow may not have yet resumed operation.
- *Pipeline Transport of Crude Oil and Refined Products.* Pipelines from the Gulf to the Midwest and East Coast have been affected. The Colonial Pipeline — serving the whole East Coast with refined products — was operating at full capacity early in the week of September 5. Its capacity

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<sup>1</sup> For additional information, see CRS Issue Brief IB87050, *The Strategic Petroleum Reserve*, by Robert L. Bamberger.

<sup>2</sup> Energy Information Administration, *Special Report — Hurricane Katrina's Impact on U.S. Energy*, at [[http://tonto.eia.doe.gov/oog/special/eia1\\_katrina.html](http://tonto.eia.doe.gov/oog/special/eia1_katrina.html)], frequently updated.

<sup>3</sup> Ibid.

is 2.4 million barrels per day. Because the pipeline was full when it went down, deliveries of gasoline and middle distillates were immediate. The Capline pipeline resumed operation on September 1 at a reduced rate of 720,000 b/d, pending restoration of full operation of LOOP, and is now operating at 960,000 b/d, or 80% of its capacity.

- *Product Imports and International Energy Agency (IEA) Response.* On September 2, the IEA initiated a coordinated stock drawdown of 60 million barrels of crude and refined product stocks from Europe and Asia. Two million barrels daily will be released. Gasoline imports currently on the water should begin reaching the United States by mid-September.<sup>4</sup> The IEA has indicated a willingness to release strategic stocks held by member countries if the situation warrants.

## Refineries

Several major facilities in Louisiana and Mississippi are closed. Refineries in the region are located in low-lying areas and have sustained some water damage. Roughly 1.3 million barrels of refining capacity in the Gulf remains completely shut down, but total capacity lost may approach 2.0 million barrels. Some refineries anticipate resuming operations within the next few weeks. Others still lack power and have water damage. When refineries resume operation, runs are sharply reduced and increase over a number of days.<sup>5</sup> (See **Table 1.**) Electric power appears to have been restored to all but two refineries in the New Orleans vicinity.<sup>6</sup> Refiners are also concerned about staffing facilities because employees have been scattered by the storm; there is both concern and uncertainty whether some will return to the region. Chevron has placed an advertisement asking employees to phone.<sup>7</sup>

## Electric Power<sup>8</sup>

At the height of Katrina, it is estimated that 2.6 million customers lost power. Power is now being restored. Inaccessibility due to flooding and saltwater damage to equipment are major factors slowing restoration. Mississippi Power estimates that about 70% of its 8,000 miles of transmission and distribution lines will have to be repaired or replaced because of Katrina — a process the utility estimates could take four weeks. Early in the week of September 5, Mississippi Power had restored power to over 44% of its

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<sup>4</sup> *IEA Releases Emergency Crude, Gasoline*, Oil Daily, Tuesday, September 6, 2005.

<sup>5</sup> Ibid.

<sup>6</sup> The Energy Information Administration's *Hurricane Katrina Situation Report* is available at [<http://www.ea.doe.gov/hurricanes.html>].

<sup>7</sup> *Worker Displacement A Major Obstacle to Resuming Gulf Operations*, Oil Daily, Tuesday, September 6, 2005.

<sup>8</sup> Prepared by Larry Parker. For daily bulletins on Katrina's energy impacts, see [<http://www.ea.doe.gov/hurricanes.html>].

customers.<sup>9</sup> Entergy, which serves the greater New Orleans area, reports that a major obstacle to restoring service is the lack of food and water for its repair crews, who are sleeping in their trucks. Entergy reports that priority for crews includes restoring service for pumping, sanitation, medical, and housing facilities.<sup>10</sup> Power outages have hindered or delayed the resumption of pipeline operations. The Louisiana Public Service Commission is working with Entergy to assess the situation and provide guidance on priorities. FEMA Region IV is working with Mississippi officials on the same subject.

## **Relaxation of Motor Fuel Standards<sup>11</sup>**

On August 31, 2005, Environmental Protection Agency (EPA) Administrator Stephen Johnson announced that EPA would temporarily waive certain gasoline and diesel fuel standards through September 15, 2005, in order to help increase available fuel supplies. For gasoline, EPA is waiving volatility standards that would otherwise prohibit the sale of gasoline produced for northern states in the South, or the sale of “winter” gasoline in the summer months. This waiver should allow gasoline normally prohibited in certain areas to be transported to those areas in response to supply limitations. EPA is also waiving sulfur standards for diesel fuel, so that fuel produced for non-road uses may be legally used in highway vehicles. This waiver should help mitigate some of the disruption in diesel fuel supplies.<sup>12</sup>

## **Gasoline and Distillate Inventories**

As of August 26, the Energy Information Administration reported that U.S. commercial gasoline inventories were 194 million barrels, near the lower bound of the normal range. Minimum operating level is 170 million barrels, representing the point at which localized shortages occur because the distribution system cannot be drawn down further without hindering operations. At current consumption rates, this amounts to less than three days of available supply.

The situation with middle distillates (heating oil and diesel fuel) is somewhat similar, reflecting the normal seasonal build of stocks, now standing at 135 million barrels, the equivalent of nearly nine days of available supplies.

As a result of Katrina, wholesale gasoline prices on the New York Mercantile Exchange surged almost immediately, in anticipation of a shortage. At the beginning of September, wholesale gasoline traded on the NYMEX briefly surged to \$2.40 before settling to \$2.06/gallon on September 5. Pump prices also reached a new high of \$3.06 nationwide, according to the American Automobile Association. Distillate prices followed, albeit with a lower rate of increase. Following announcements of the use of SPR crude and the coordinated international stock drawdown from IEA nations, prices retreated early in the week of September 5.

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<sup>9</sup> Ibid.

<sup>10</sup> For more information on Entergy’s efforts, see [<http://www.entergy.com/corp/>].

<sup>11</sup> Prepared by Brent Yacobucci.

<sup>12</sup> Remarks by Administrator Stephen L. Johnson, United States Environmental Protection Agency, August 31, 2005, [<http://www.epa.gov/katrina/activities.html>].

## Commercial Inventories of Crude Oil

Crude stocks were 321 million barrels on August 26, up from 285 million barrels during the same period last year. Minimum operating level for crude is 270 million barrels, suggesting that 51 million barrels might be available from existing inventories. This could be used to offset the shortfall of OCS production and imports, if it were located where it could be accessed by refiners seeking replacement crude. But it is not clear that logistics would support this, nor is it clear how rapidly refining capacity to utilize these inventories will be restored.<sup>13</sup> New stock numbers should be available on September 8.

## Strategic Petroleum Reserve

On August 31, Secretary of Energy Bodman announced that the Administration was authorizing loans of crude oil from the Strategic Petroleum Reserve. By September 6, loans had been granted to six companies totaling roughly 12.5 million barrels.<sup>14</sup> But as noted above, the SPR will be of limited help in this situation if there is insufficient refining capacity to turn its stocks of crude oil into gasoline or diesel fuel.

**Table 1. Major Refineries Affected by Hurricane Katrina**

Capacity (thousands of barrels per day)	Owner	Location	Status as of 9/1
493.5	ExxonMobil	Baton Rouge, LA	"Fully operational." Receiving SPR crude.
187.0	ExxonMobil/PDVSA	Chalmette, LA	Shut. No power. Water damage.
325.0	Chevron	Pascagoula, MS	Shut. Power restored, but major damage.
226.0	Motiva Enterprises <sup>15</sup>	Norco, LA	Limited damages, repairs in progress, may restart this week.
235.0	Motiva Enterprises	Convent, LA	Restarting. May be "fully operational" soon.
247.0	ConocoPhillips	Belle Chase, LA	Shut. No power. Major damage.

<sup>13</sup> For weekly updates on inventories, as well as spot prices, see Energy Information Administration, *Weekly Petroleum Status Report*, [<http://tonto.eia.doe.gov/oog/info/twip/twip.asp>].

<sup>14</sup> Department of Energy. Office of Fossil Energy. See: [[http://www.fe.doe.gov/news/techlines/2005/tl\\_spr\\_loan\\_090105.html](http://www.fe.doe.gov/news/techlines/2005/tl_spr_loan_090105.html)].

<sup>15</sup> Motiva is a joint venture between Royal Dutch Shell and Saudi Aramco.

245.0	Marathon-Ashland	Garyville, LA	Restarting.
120.0	Murphy Oil	Meraux, LA	Shut. Some water damage.
185.0	Valero Energy	St. Charles, LA	Restarting.

**Source:** *Oil Daily*, September 2, 2005, p. 2. The Energy Information Administration's *Hurricane Katrina Situation Report* is available at [<http://www.ea.doe.gov/hurricanes.html>].